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ECONOMICS OF THE DAIRY COW ENTERPRISE

(Revision of Factsheet "Economics of the Dairy Cow Enterprise" August 1979)

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The sale of milk and cream contributed slightly over $1 billion in cash receipts to Ontario farmers in 1984. Approximately one dollar in five (about 20% of the farm cash receipts) received by all Ontario farmers over the past several years has come from the sale of milk and cream (Table 1). In addition, there are the returns from sales of dairy livestock. In total, about one-quarter of the Ontario farm cash receipts are derived from the dairy industry.

Figure 1. Tapered-board feeder for handling silages and complete rations

Dairy cow numbers in the province have been declining for several years. In 1964 there were about 1 million cows kept for milk purposes. In 1984 there were 540,000 milking cows in Ontario. This was a decrease of almost 50% over the 20-year period. At the same time, milk production per cow has increased significantly.

Table 1. Farm Cash Receipts and Milk and Cream Sales, Ontario 1974-84

Year	Farm Cash Receipts	Farm Milk and Cream Sales	Dairy Sales as % of Total Cash Receipts
	Million $	Million $	%
1984	5330	1003	19
1983	5068	935	19
1979	4022	682	17
1974	2487	470	19

Source: Agricultural Statistics for Ontario

In Ontario, total milk production has remained relatively stable over the past 15 years. Total milk production in 1984 was just under 2.5 billion litres which was lower by 4% than it was in the early 1970's. Over the same period of time, the number of dairy farmers has decreased markedly. At mid-year 1985 there were 10,574 licensed milk shippers in Ontario.[1] The trend is to fewer dairy farms, moderately larger herds, with an increase in milk and fat production per cow.

Data from the Ontario Dairy Farm Accounting Project (Table 2) is obtained from a random sample of Ontario dairy farms. During 1981-83 the farm labor force stayed at about the same size per farm while the total investment per cow has continued to increase. This increase is a result of more investment in labor saving equipment and higher prices for equipment and real estate.

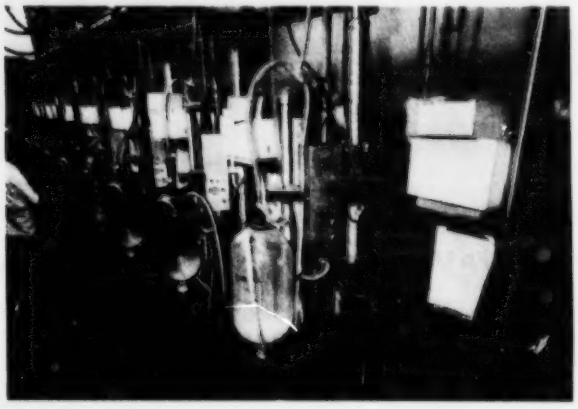

Figure 2. Modern milking parlor with milk production measuring devices

[1] *There are an additional 2,100 cream shippers licensed as of June, 1985 by the Ontario Cream Producers Marketing Board and who must have Market Share Quota in order to ship cream.*

Table 2. Ontario Dairy Farm Size and Investment Trends 1981-1983

	1981	1982	1983
Number of Farms	119	148	139
Cows per Farm	42	43.5	42.9
Milk Sales (Litres) per Cow	5132	5193	5106
Man Equivalent per Farm	2.0	2.1	2.0
Tillable Hectares	86.7	89.8	85.6
Machinery Investment per Cow $*	1913	2032	2080
Total Investment per Cow $*	12827	13538	15174

** Assets were valued at market prices.*
Source: Ontario Dairy Farm Accounting Project

MARKETING

All milk in Ontario is marketed through a producer-controlled marketing agency, the Ontario Milk Marketing Board (OMMB). In order to ship milk in Ontario, a dairy farmer must be licensed by the OMMB. To obtain a licence, the herd and production facilities must meet the health and sanitary standards enforced by the Dairy Inspection Branch of the Ontario Ministry of Agriculture and Food.

Figure 3. A Modern Dairy Farm

All shipments of milk must be covered by either fluid quota (Group 1 Pool) or industrial quota (Market Share Quota or MSQ). Some producers have both fluid and industrial quota, while other producers have industrial quota only. Producers are paid according to the utilization of their milk by dairy plants. Milk marketed as fluid milk commands the highest price. Milk manufactured into cheese, butter, skim milk powder and other processed milk products returns a lower price to the producer.

To sell milk in Ontario and receive the prices indicated in Table 3, the farmer must have Group 1 Pool Quota and/or MSQ of a sufficient amount to cover the total annual milk production to be sold from the farm.

In planning production goals, dairy farmers should consider these goals within the framework of the milk pricing and quota systems.

Marketing policies on price, quota, subsidies and other marketing concerns are the responsibility of the OMMB, the Milk Commission of Ontario and the Canadian Dairy Commission.

Payment to the producer is based upon the volume of milk shipped and adjusted for the milk fat content. Transportation fees and other administrative costs are also on the basis of volume of milk shipped. Cream producers are paid based upon the weight (kg) of butterfat shipped.

The prices listed in Table 3 are for milk at the standard of 3.6 kg of butterfat per hectolitre (hL). For each 0.10 kg increase or decrease in butterfat content, the base price of milk is increased or decreased by $0.6275 per hL. For example, each 0.10 kg increase of butterfat per hectolitre means a $126 per month increase in the milk cheque for a 40 milking cow herd shipping 6,000 L of milk per cow per year.

Milk recording programs in Canada utilize a weight-based instead of volume-based system, with the unit of measurement being the kilogram. As milk has a greater density than water, a litre of milk weighs more than one kilogram. In comparing weight and volume of milk, it takes 1.03 kg of standard milk to equal one litre (one hectolitre of milk weighs 103 kg).

A sample of milk with 3.5 percent milk fat by weight as measured by a milk recording program is equivalent to 3.6 kg/hL as now used for payment purposes.

For fluid milk, the basic price received by the farmer is determined by the OMMB with the aid of a formula which considers, among other items, costs incurred by farmers in producing milk, wage levels of the consuming public, and general performance of the economy.

For industrial milk (i.e., milk used for manufactured dairy products), the price is established by the OMMB based on a target return level for industrial milk and support prices for butter and skim milk powder, which are established by the federal government. As shown in Table 3, a direct payment (subsidy) of $6.03 per hL is currently provided by the federal government through the Canadian Dairy Commission (CDC) on all industrial milk produced and covered by Market Share Quota.

The Industrial Milk Target Returns Formula is used to develop a Canada-wide target return level for industrial milk. This formula uses several factors to develop this target price. The two major components are indexed cash input costs and the consumer price index. The final actual price paid is decided by the provincial agencies involved and may not be equal to the target support price.

Table 3. Milk Prices and Charges - Southern Ontario, September 1985

	Charging Policy and Rates for Milk Containing Butterfat at 3.6 kg/hL	
	Sold for Fluid Use	Sold for Manufacturing Use
Basic price/hectolitre	$52.51[1]	$40.97[2]
CDC Subsidy	None	6.03
Charges and Levies[3]		
Administration	0.16	0.16
Market expansion	0.578	0.578
ODHIC[4]	0.03	0.03
Transportation	1.83	1.83
CDC within-quota levy	0.30	5.14
CDC special export levy	None	29.73
CDC over-quota levy	None	38.00

[1] Southern Ontario producers receive this price for about 70% (dependent on sales of fluid milk) of their Group 1 Pool Quota. The rest is paid for at the manufacturing price level.
[2] This is a blended price for all milk used for various manufacturing purposes, e.g. cheese, butter, skim milk powder, yogurt, etc.
[3] For an explanation of levy and quota policies, see Quota Policies of the Ontario Milk Marketing Board.
[4] ODHIC stands for Ontario Dairy Herd Improvement Corporation.

TARGETS TO AIM FOR IN THE DAIRY BUSINESS

Production Goals

Milk sold/man/year ..... 200,000 kg or 194,000 L.
(this could be 30 cows producing 6,670 kg milk/cow/year).
Ship 100% of available milk quota.
Maintain a herd average production level that is at least 10% or more above provincial averages (see Table 4).

Table 4. Average Annual Milk, Fat and Protein Production per Cow by Breed - 1984

Breed	BCA		Production/Cow/Year				
	Milk	Fat	Milk	Fat	Fat	Protein	Protein
	Index		-kg-		%	kg	%
Holstein	133	132	6340	235	3.7	203	3.2
Jersey	132	121	4227	207	4.9	152	3.6
Ayrshire	141	134	5088	198	3.9	168	3.3
Guernsey	132	125	4702	212	4.5	165	3.5
Brown Swiss	133	134	5189	213	4.1	182	3.5

Source: 1984 ODHIC Progress Report

Cow Management Goals

Classify to improve physical quality.
Enrolled in an official milk recording program.
Average period cow remains in the herd ..... 3.5 lactations.
% herd comprised of first calf heifers ..... 25-30%.
Maintain or increase % Butterfat.

Herd Health Goals

Six month average bulk tank somatic cell count ..... less than 200,000.
Six month average bulk tank plate loop count ..... less than 10,000.
% herd culled for productive reasons ..... 20-30%.
% herd culled for non-productive reasons ..... less than 10%.
Enrolled in an individual cow somatic cell count program.
Enrolled in a regular herd health program.

Reproductive Performance Goals

Average number of days to first service ..... 70 days.
Average number of days open ..... 90-100 days.
Average calving interval ..... 12-12.5 months.
Average number of services/cow ..... 1.7.
% cows checked in calf after one service ..... 60%.
% herd culled for reproductive reasons ..... 5% or less.

Feed and Feeding Management Goals

Grain fed/cow producing 7000 L milk/year ..... 2,500 kg.
Hay and hay crop silage that analyzes 17% crude protein or better and 60% TDN or better on a dry matter basis. Good crop management to optimize yields and reduce costs per tonne fed is essential.

Feed nutritionally balanced rations based on analyses of available feeds and accurate measurements of daily feed intakes.

Utilization of good cow management techniques to get the most from the cow.

Calf and Heifer Management Goals

Calves - 95% of calves born alive.
- 100% of live-born calves reared or marketed.
- 90% of calves weaned by 6 weeks of age.

Heifers - aim to have heifers large enough to breed at 15-16 months of age (360 kg for large breeds and 260 kg for small breeds) and calving at 24-25 months of age.

Breeding Goals

Heifers should have at least a breed average or better genetic index for milk and fat.
First calf heifers should have BCA's for milk and fat that are at least equal to herd average or better.
First calf heifers should average above breed average score on first classification or above average % GP or better.
Service sires should average + 5 or better for milk, fat and final classification.
Service sires should be at least + 5 or better for those type traits for which improvement is needed.
Dams of future replacements should have production records equal to or above the herd average and a type of classification score of GP or better.
Aim to achieve a minimum of 25-40% of young sires as a percent of all breedings.

CAPITAL INVESTMENT

The following estimate is an average of the reported investment of 139 dairy farms in the 1983 Ontario Dairy Farm Accounting Project located across southern Ontario. This is a general measure of the capital resources used in the dairy business and should reflect what things would bring at a well-attended auction sale.

This represents the investment for a herd of cows and their following and 86 tillable hectares. It should be noted that there is considerable variation in land prices throughout the province and the figures may not reflect current farm market values for land and buildings (Table 5.)

Table 5. Dairy Farm Investment per Farm - Ontario 1983

	Investment	% of Total Investment
Land and Farm Buildings	310,023	48
Machinery and Equipment	89,230	14
Livestock	72,015	11
Milk Quota	148,220	23
Feed, Crop and Supplies Inventory	23,995	4
Total Farm Assets	643,483	100

Source: Ontario Dairy Farm Accounting Project

TABLE OF SOME METRIC EQUIVALENTS

1 Kilogram (kg)	=	2.2 pounds
1 litre (L)	=	2.27 pounds
1 kilogram of milk	=	0.97 litre (L)
1 hectolitre (hL)	=	100 L and 103 kg of milk

BUDGET WORKSHEET

The budget worksheet provides the opportunity to compare your present dairy operation with operations at two different levels of management. Prospective producers may gain some insight into the costs and potential returns from the dairy business. Keep in mind that these are estimate figures and should be used only as a guide with which to compare your own figures.

Note that the budget does not include interest on borrowed capital or a cost figure for hired labor. **The net income figure is the amount left over to pay for the operator's labor, management and capital.** If part of the labor is hired and/or some of the capital is borrowed, then the cost of these items would need to be deducted from the net income.

DAIRY BUDGET EXAMPLES AND WORKSHEET*
(Based on income/expense per cow - including young stock)

	EXAMPLE A Average Dairy Farm	EXAMPLE B High Production Dairy Farm	YOUR FARM
		- dollars -	
INCOME			
Milk Sales			
5500L (3.6 kg fat/hL milk @ $48/hL)	2,640		_____
7000L (3.6 kg fat/hL milk @ $48/hL)		3,360	_____
Livestock Sales (Breeding & Cull Stock)	300	450	_____
TOTAL INCOME	2,940	3,810	_____
DIRECT COSTS			
FEED			
Forages			
_____ Hay @ _____/tonne			_____
_____ Haylage @ _____/tonne			_____
_____ Corn Silage @ _____/tonne			_____
_____ @ _____/tonne			_____
Total Forage Costs (6.33 tonnes dry matter)	466	466	_____
Grains & Supplements			
_____ @ _____/tonne			_____
_____ @ _____/tonne			_____
_____ @ _____/tonne			_____
_____ @ _____/tonne			_____
Total Grain & Supplement Costs (2.5 tonnes)	500		
(3.5 tonnes)		735	_____
Minerals & Vitamins	30	30	_____
TOTAL FEED COSTS	996	1,231	_____
OTHER COSTS			
Marketing & Hauling (Avg. $4.50/hL)	225	315	_____
Vet & Medicine	45	90	_____
Breeding Fees	25	70	_____
Stable, Milkhouse etc.	60	90	_____
TOTAL OTHER COSTS	355	565	_____
TOTAL DIRECT COSTS	1,351	1,796	_____
INDIRECT COSTS			
Taxes & Insurance	110	110	_____
Telephone & Hydro	80	80	_____
Building Repair & Maintenance	65	65	_____
Depreciation - Bldgs. & Mach.	325	325	_____
TOTAL INDIRECT COSTS	580	580	_____
TOTAL ALL COSTS	1,931	2,376	_____
INCOME TO LABOR, MANAGEMENT & CAPITAL			
per cow	1,009	1,434	_____
30 cow herd	30,270	43,020	_____
45 cow herd	45,405	64,530	_____
70 cow herd	70,630	100,380	_____

* *See comments on page 3 re Budget Worksheet.* *Based on 1984 Ontario Farm Management Analysis Project.*